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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PATEL, VINIT H

ART UNIT PAPER NUMBER

1764

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/761,789	<b>Applicant(s)</b> REI, MIN-HON	
	<b>Examiner</b> Vinit H. Patel	<b>Art Unit</b> 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 24-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>21Jan04</u> | 6) <input type="checkbox"/> Other: _____  |

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**DÉTAILED ACTION**

***Election/Restrictions***

Applicant's election without traverse of claims 1-23 in the reply filed on March 14, 2006 is acknowledged.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11 and 23 contain the trademark/trade names DASH220 and N220.

Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a supported material and, accordingly, the identification/description is indefinite.

***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Amiridis et al., WO/9943610.

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Regarding claim 1, Amiridis teaches a shell and tube reactor 30 module for hydrogen production, comprising: a reactor 30 having a shell side, at least one palladium membrane tube 32 as a tubular section, and a steam reforming catalyst 38 in said shell side, wherein said at least one palladium membrane tube has one sealed end 34 located at upstream of flowing path (P4/L4-30; P5/L1-30; Figs. 1 & 4).

Regarding claim 2, Amiridis teaches wherein said palladium membrane tube 32 is formed by mounting a palladium membrane on a porous support, wherein said palladium membrane is made of one selected from a group consisting of palladium, a palladium-silver alloy and a palladium-copper alloy (Fig. 1; P1/L7-29).

Regarding claim 3, Amiridis teaches wherein said porous support is made of stainless steel (P4/L4-20).

Regarding claim 4, Amiridis teaches wherein a length of said at least one tube is between 3 cm and 120 cm (Figs. 1 & 4; P4/L4-30).

Regarding claim 5, the expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

Regarding claim 6, Amiridis teaches fuel is selected from a group consisting of ethanol, methanol, isopropanol, hexane, gasoline, methane and a mixture thereof (P1/L3-5). Furthermore, the expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amiridis et al., WO/9943610 in view of Clawson et al., USP 6,648,480 and Willms, USP 5,525,322.

Regarding claim 7, Amiridis teaches all of the limitations as applied to claim 1 above and further discloses a steam reforming catalyst bed, but does not explicitly teach the steam reforming catalyst is one of CuOZnOAl.sub.2O.sub.3, PdOCuOZnOAl.sub.2O.sub.3 and K.sub.2O,NiO/.gamma.-Al.sub.2O.sub.3. Clawson teaches a reactor for hydrogen production wherein the steam reforming catalyst is one of CuOZnOAl.sub.2O.sub.3, PdOCuOZnOAl.sub.2O.sub.3 and K.sub.2O,NiO/.gamma.-Al.sub.2O.sub.3 (C3/L15-33), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Amiridis with Clawson for the purpose to provide a catalyst with high activity (C4/L24-40 of Willms).

Regarding claim 8, Amiridis teaches a catalytic combustion section 38 having a noble metal catalyst dispersed on a supporting material for heating said reactor (Fig. 4).

Regarding claim 9, Amiridis teaches a catalytic combustion section is made of a stainless steel (P4/L4-20; Fig. 4).

Regarding claim 10, Clawson teaches a noble metal is selected from a group consisting of platinum (Pt), palladium (Pd), rhodium (Rh), Ruthenium (Ru) and a mixture thereof (C3/L15-65).

Regarding claim 11, Clawson teaches a shell and tube reactor module according to claim 8, wherein said supporting material is one selected from a group consisting of gamma.-alumina, titania, zirconia, silica, DASH220 (NE Chemtec, Inc. Japan) and N220 (Sud Chemie Catalysts, Japan, Inc.) (C3/L15-65).

Regarding claim 12, Clawson teaches a a reservoir containing fuels without H.sub.2O provided for starting up heating (Figs. 1 & 2).

Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amiridis et al., WO/9943610

Regarding claim 13, Amiridis teaches a shell and tube reactor 30 module for hydrogen production, comprising: a reactor 30 having a shell side, at least one palladium membrane tube 32 as a tubular section, and a steam reforming catalyst 38 in said shell side, wherein said at least one palladium membrane tube has one sealed end 34 located at upstream of flowing path (P4/L4-30; P5/L1-30; Figs. 1 & 4), however does not explicitly teach a reactor splitting into two reactor sections and having a common shell. However, such modification is a mere duplication of parts has no patentable significance unless a new and unexpected result is produced and it would have been obvious to one of ordinary skill in the art to modify Amiridis to include a reactor having two duplicate reactor sections for the purpose to produce more hydrogen output. See

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MPEP 2144.

Regarding claim 14, Amiridis teaches wherein said palladium membrane tube 32 is formed by mounting a palladium membrane on a porous support, wherein said palladium membrane is made of one selected from a group consisting of palladium, a palladium-silver alloy and a palladium-copper alloy (Fig. 1; P1/L7-29).

Regarding claim 15, Amiridis teaches wherein said porous support is made of stainless steel (P4/L4-20).

Regarding claim 16, Amiridis teaches wherein a length of said at least one tube is between 3 cm and 120 cm (Figs. 1 & 4; P4/L4-30).

Regarding claim 17, the expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

Regarding claim 18, Amiridis teaches fuel is selected from a group consisting of ethanol, methanol, isopropanol, hexane, gasoline, methane and a mixture thereof (P1/L3-5). Furthermore, the expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

Claims 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amiridis et al., WO/9943610 in view of Clawson et al., USP 6,648,480 and Willms, USP 5,525,322.

Regarding claim 19, Amiridis teaches all of the limitations as applied to claim 13 above and further discloses a steam reforming catalyst bed, but does not explicitly

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teach the steam reforming catalyst is one of CuOZnOAl.sub.2O.sub.3, PdOCuOZnOAl.sub.2O.sub.3 and K.sub.2O,NiO/.gamma.-Al.sub.2O.sub.3. Clawson teaches a reactor for hydrogen production wherein the steam reforming catalyst is one of CuOZnOAl.sub.2O.sub.3, PdOCuOZnOAl.sub.2O.sub.3 and K.sub.2O,NiO/.gamma.-Al.sub.2O.sub.3 (C3/L15-33), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Amiridis with Clawson for the purpose to provide a catalyst with high activity (C4/L24-40 of Willms).

Regarding claim 20, Amiridis teaches a catalytic combustion section 38 having a noble metal catalyst dispersed on a supporting material for heating said reactor (Fig. 4).

Regarding claim 21, Amiridis teaches a catalytic combustion section is made of a stainless steel (P4/L4-20; Fig. 4).

Regarding claim 22, Clawson teaches a noble metal is selected from a group consisting of platinum (Pt), palladium (Pd), rhodium (Rh), Ruthenium (Ru) and a mixture thereof (C3/L15-65).

Regarding claim 23, Clawson teaches a shell and tube reactor module according to claim 8, wherein said supporting material is one selected from a group consisting of .gamma.-alumina, titania, zirconia, silica, DASH220 (NE Chemtec, Inc. Japan) and N220 (Sud Chemie Catalysts, Japan, Inc.) (C3/L15-65).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Search report of EP 1561725A1.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinit H. Patel whose telephone number is (571) 272-0856. The examiner can normally be reached on 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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